this era that the great tract of low land lying on the east of England was reclaimed from the sea by the construction of 50 miles of sea-banks, and the 60,000 acres in the district known as Romney Marsh was protected from the sea by a bank 4 miles long and 20 feet high. From the time of the Romans to the Stuart period very little seems to have been attempted in this way, but at that time there are records of innumerable grants made to "undertakers" and "adventurers" who undertook to reclaim the low lands in the Isle of Axholme, Haxey Chase and the Fens of Lincolnshire and Cambridgeshire, and other parts of the country, in return for a certain proportion of the land reclaimed. Another revival took place during the present century at the time when agriculture was prosperous, and land-owners were tempted, by the high rents then paid, to reclaim from the sea numerous intakes of salt marshes by the construction of sea banks in the estuaries of the Humber, the Wash, the Thames, the Severn and other rivers. Since rents have fallen and land-owners have become impoverished by the low rents, and the heavy charges thrown on estates by the payment of the death duties, little or no inclosing has taken place. Land, however, shows signs of recovering something of its former value. The appearance, therefore, of a book dealing with the reclamation of land from tidal waters may be considered as opportune.

The only standard English book on this subject is that of the late Mr. John Wiggins on the "Practice of Embanking Lands from the Sea," which is now out of print. Instead of publishing a new edition with the extensive alterations of the text that would be required to bring this work up to date, the author of the book now under review was invited by the publishers to undertake the preparation of a new treatise, in which all that was applicable to modern practice in Mr. Wiggins' book has been incorporated.

The author has carried out his task efficiently and well, and his book contains a large amount of information that will be of great service to engineers, and also to landed proprietors and others interested in works of reclamation.

The book makes no pretensions to originality; on the contrary, it may be regarded as an epitome of the information and opinions contained in a vast number of papers contained in the *Minutes of Proceedings* of the Institution of Civil Engineers and the papers of allied societies, and in the works of authors on drainage and Fen history.

A careful perusal of a book of this character, and the principles laid down that should be observed in the reclamation of land, might have saved the expenditure of many thousands of pounds on schemes that never came to maturity or have proved financially disastrous. Of these, as examples, may be quoted the great scheme that was at one time entertained, and still has advocates, for the formation of a new county in the Wash, by the enclosure of the sands; an offshoot of which was the abortive scheme of Sir John Rennie for reclaiming 30,000 acres, the greater part of which was bare sands, which experience has since proved would have been utterly unfit for cultivation; and the Norfolk Estuary Scheme, which received parliamentary sanction in 1846 to reclaim 30,000 acres submerged at high water, and of which up to the present time, after an expenditure of nearly 400,000*l*., there has only been reclaimed 2000 acres of marsh land adjacent to the coast, a great part of which formed the bed of the diverted river. In this case, great benefit has resulted to the drainage of the country by a new direct cut made for the outfall of the river Ouse; but as a land reclamation scheme, it has been a most disastrous failure, owing to the misconception of the promoters as to the action of the sea in forming deposit on the coast, and of the difficulties attending the construction of sea banks.

Mr. Beazeley's book is divided into nine chapters, dealing respectively with: (1) General observations; (2) the site for a bank; (3) the construction of sea banks; (4) the drainage of the land reclaimed; (5) maintenance and repair of sea banks; (6) warping land; (7) cultivation after enclosure; (8) examples of reclamation, value and rents; (9) legal requirements; the text being accompanied by numerous illustrations.

## THE MAMMALIAN BRAIN.

*Handbuch der Anatomie und vergleichenden Anatomie des Centralnervensystems der Säugetiere.* Von Dr. Edw. Flatau und Dr. L. Jacobsohn. I. Makroskopischer Teil, mit 126 Abbildungen im Text, und 22 Abbildungen auf 7 Tafeln. Pp. xvi + 578. (Berlin: Verlag von S. Karger, 1899.)

THE handsome volume before us is a welcome addition to works on the comparative anatomy of the mammalian brain. That the literature of this subject is already vast, may be gathered from the fact that nearly 300 papers are quoted at the end of the volume—this list forming indeed a most useful bibliography. So numerous and scattered are these various works, that only those students who have access to very complete libraries can hope to be able to consult the majority of them, and we have long felt the want of a trustworthy account of the structure of the brains of the various orders of mammalia in a more handy form. This want is to a great extent satisfied by the work of Drs. Flatau and Jacobsohn, which is rather of the nature of an original contribution than of a text-book. For it is no mere compilation; but, on the contrary, almost entirely consists of the description of brains studied by the authors themselves in Prof. Waldeyer's Anatomical Institute in Berlin.

With admirable care the authors describe the structure of the central nervous system of representative examples of all the living orders of mammalia. To give the reader some idea of the thoroughness of their method, one may mention that in the case of the brain of the Chimpanzee, for example, we find paragraphs on the brain weight, the relation of the brain to the skull, the general shape and measurements of the brain, followed by detailed accounts of the convolutions of the cerebral hemispheres, the structure of the corpus callosum, fornix, &c., of the Diencephalon, Mesencephalon, Metencephalon, Myelencephalon, and Medulla spinalis. Naturally the types of all the orders are not treated in quite as much detail as the Chimpanzee. At the end of the chapter on monkeys and apes are elaborate tabular statements of the authors' observations compared with those of previous writers on the subject. Throughout, the text is illustrated by excellent figures, almost all of which are original. The general

reader will be especially attracted by the ingenious representations of the brain drawn inside the skull as if seen by transparency, and by the really beautiful series of plates at the end of the volume.

The work is essentially a technical and a practical one. Nevertheless, a final chapter is devoted to a general summary and conclusions. Here Drs. Flatau and Jacobsohn aim, not at bringing forth sensational results, but soberly review such general conclusions as may safely be drawn at present. These, it must be confessed, are somewhat disappointing, not, be it understood, through any fault of the authors, but owing to the inherent difficulties and complications of the subject, and the comparatively few data yet at our disposal.

As to the attempt to homologise the fissures of the cerebral hemispheres with one another in the various orders of mammalia, Drs. Flatau and Jacobsohn freely adopt Gegenbaur's conclusion, that this can only be done to a very limited extent. In most of the orders we generally find some small and lowly organised forms with almost smooth brains ; and it must always be borne in mind that the fissures and convolutions may to a great extent have been independently developed in each group.

Of the usefulness of this volume there can be no doubt, and the appearance of the continuation of the work will be awaited with interest by all workers in the subject of brain anatomy.

## OUR BOOK SHELF.

*The Origin of the British Flora.* By Clement Reid, F.R.S., F.L.S., F.G.S. Pp. vii+191. (London : Dulau and Co., 1899.)

THIS is a useful contribution to the literature of geographical botany ; but it is unfortunate that the author has given it the ambitious title of "Origin of the British Flora." Any one entering upon the perusal of the book with the expectation engendered by its title will soon meet with disappointment, but must not be blinded thereby to its real merit, which is great, and consists in the historical records, to which two-thirds of it are devoted. The book is essentially a geologist's account of the palæontological evidence of the distribution of plants in Britain during recent geological periods. Every one will agree with the author in thinking that the historical method is the proper one for determining questions of origin, but that the "problem of the origin of our flora is one which can be solved by this method" is surely a sanguine forecast on his part, even allowing for the fact that the flora of our Tertiary deposits has not been worked out yet with much completeness ; his work is emphatic testimony to the fragmentary character of historical evidence in relation to the British flora that has been obtained up to the present time. In his "Table showing the Range in Time of the British Flora," which includes the names of species, remains of which have been found in deposits of pre-Glacial age onwards, there are not three hundred names, and of these not all have as yet been found in deposits within the present area of Britain ; and, moreover, the finds do not touch elements of the flora which have always been a crux in explanations of its origin. The first fifty pages of the book deal, in the slight manner of the magazine article rather than in the detail of a scientific treatise, with some of the problems of the origin of the present British flora. The author is on the side of those who attribute a more important influence to air-transport than to land-connection as a factor in the making of our existing flora. The Watson-Forbes hypothesis is, in a few sentences, put on one side, and a short chapter is devoted to an account of the transport-mechanism observable in the species of the flora. In Chapter iv. we have an account of the author's idea of the geographical and climatic changes affecting Britain in the late Tertiary times ; the former, the author thinks, "were of no very great importance as bearing on the past history of our flora," although they "must have tended greatly to modify local conditions, and must have sometimes aided, sometimes have hindered, the dispersal of the seeds" ; the latter have left their mark on the flora ; but at the same time "Britain shows signs of a geographical distribution of plants largely independent of that due to climate ; or perhaps we should say not governed by existing climatic conditions." It is not, however, these brief earlier chapters which give value to the book, but the later ones, containing accounts of the deposits in which recent plants have been found and of the positions of these plants.

*A Manual of Marine Meteorology for Apprentices and Officers of the World's Merchant Navies.* By William Allingham. Pp. viii + 182, and plates. (London : Charles Griffin and Co., Ltd., 1900.)

WE gladly give a word of welcome to this little book, written as it is by a sailor with the view of winning an increase of interest in the subject of meteorology from members of his own profession. The author knows well those for whom he is writing, so that while he has kept his book free from pedantry, he has managed to fill it with practical information and to endow it with the spirit of earnest purpose. The encouragement of a more complete survey of the complicated phenomena manifested, not only in our atmosphere, but in the ocean itself, is highly commendable, and we should imagine the author well qualified by knowledge and experience to interest the class to whom he mainly addresses himself. For he has sailed every ocean in all sorts of weather, and having himself to some extent profited by the systematised experience of others, he seeks now to widen and complete the circle of observation, so that those who come after may have still more trustworthy sources of guidance and readier means for escaping the perilous chances of navigation.

Of course, in many respects marine meteorology goes hand in hand with meteorological inquiries conducted on shore. We may pass over all such details, since the real interest of the book is more closely connected with the practical questions which arise at sea. Among these we may enumerate wave-motion, salinity and temperature of the sea, the direction and velocity of ocean currents, and the construction and use of pilot charts. Such subjects ought to have a profound interest for an intelligent officer, and the method of treatment is likely to call forth the earnest attention of any one who wishes to become really efficient. Some of these subjects may be thought to belong rather to hydrography than to meteorology ; while, again, questions connected with the behaviour of the wind in cyclones, and of the management of the ship in the neighbourhood of cyclonic disturbances, may be said to belong to the domain of seamanship or practical navigation. But there is no fixed line of demarcation between any of these subjects, and trained intelligence is of the greatest service in advancing our knowledge of subjects in which experiment and generalisation play a great part. One can easily conceive that enormous advantages would accrue to science by enlisting the services of a large army of observers, and therefore we welcome any well-considered effort which has for its end so worthy an object. The author knows perfectly well that it is impossible to do justice, within a moderate compass, to the many topics on which he touches ; but his object is served, and well served, if he can arouse an active interest in the many, and induce a few to prosecute inquiries on a more comprehensive basis.